ASSM 2021 BEIJING, CHINA May 14–17, 2021
3rd CONGRESS OF ASIAN SOCIETY OF SLEEP MEDICINE

The role of Sesn2/AMPK/mTOR signaling pathway in the abnormal glucose metabolism caused by intermittent hypoxia and reoxygenation

Xinjie Chen[1],Hongfei Liu[1],Jiahui Tian[1],Huanhuan Jin[1],Ruiting Ma[1],Yan Liu[1],Jing Du[1],Lijue Ren[1],Yunhui Lu[2],Cuiying Wei[1]
1.the First Affiliated Hospital of Baotou Medical College， Inner Mongolia University of Science and Technology
2.Yunnan Provincial People's Hospital

Objectives

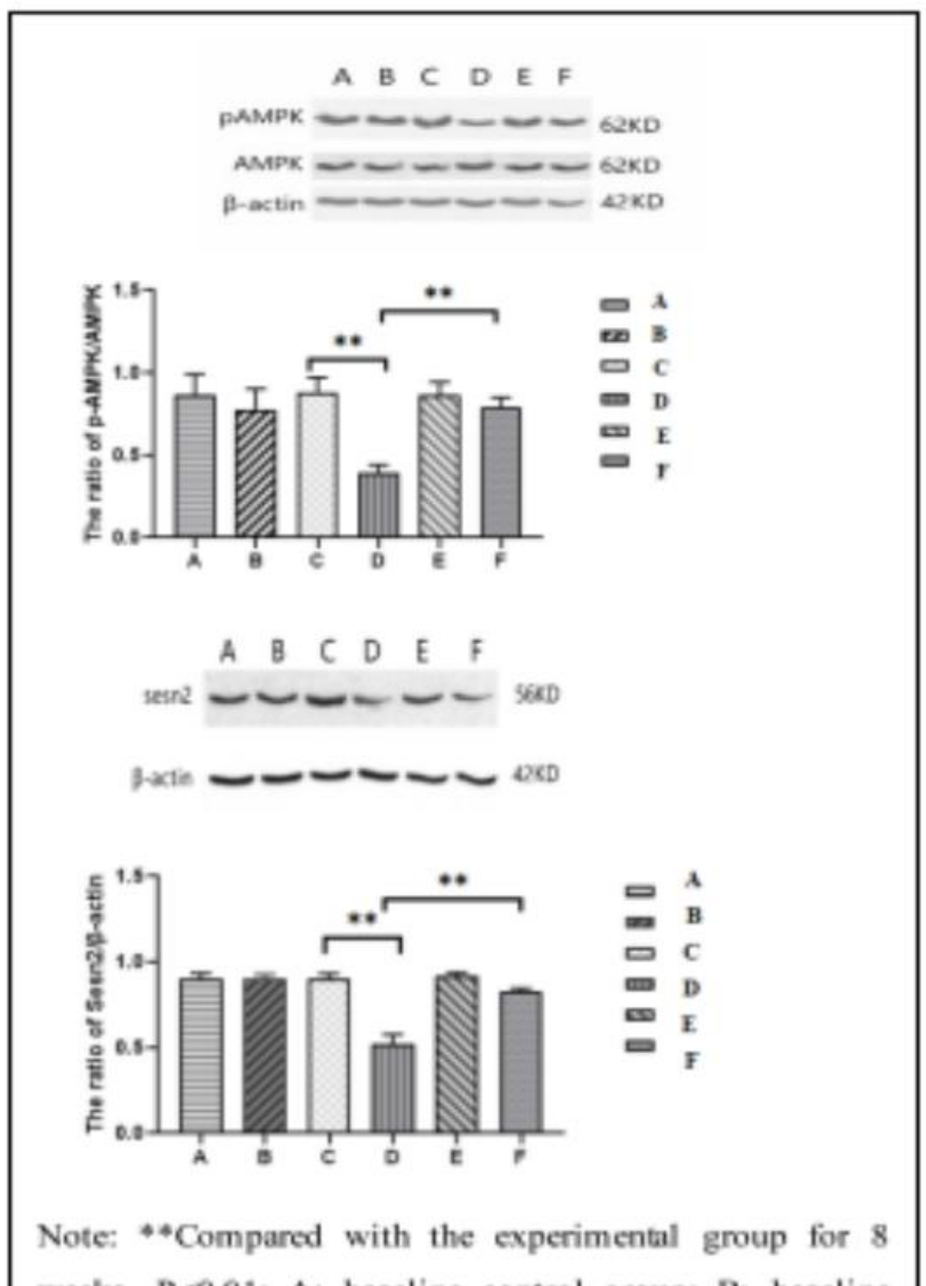
The effects of intermittent hypoxia-reoxygenation on fasting blood glucose (FBG) and fasting insulin (FINS) in rats, and explore the possible role of Sesn2/AMPK/mTOR signaling pathway.

Methods

36 rats were randomly divided into a control group (NC) and an experimental group, each with 18 rats. The experimental group was placed in an intermittent hypoxic chamber for 8 hours/d for 8 weeks, and then fed under normoxia for 4 weeks; The NC group was always fed under normoxia. The levels of FBG, FINS, liver Sesn2, AMPK, p-AMPK protein, mTOR and LC3mRNA in two groups were measured at baseline, at the 8th weekend and at the 12th weekend.

Results

Compared between groups, there was no statistically significant difference in various indicators at baseline (P>0.05); after 8 weeks of intermittent hypoxia, the levels of FBG, FINS, HOMA-IR, and mTOR in the experimental group increased, while Sesn2, p-AMPK/AMPK as well as the level of LC3 decreased, and the difference was statistically significant (P<0.05); after 4 weeks of reoxygenation, the standard indicators of the experimental group returned to the baseline level, and there was no statistically significant difference compared with the control group (P<0.05); Pearson correlation analysis showed that HOMA-IR was negatively correlated with Sesn2, p-AMPK/AMPK, and LC3 levels (r=-0.871, -0.974, -837, -0.828, P<0.05), but positively correlated with mTOR levels (r=0.851, P <0.05).



Note: **Compared with the experimental group for 8 weeks, P<0.01; A: baseline control group; B: baseline experimental group; C: control group for 8 weeks; D: experimental group for 8 weeks; E: control group for 12 weeks; F: Experimental group for 12 weeks;

Figure 1 The ratio of Sesn2/β-actin、p-AMPK/AMPK in the liver of each group

Conclusions

Chronic intermittent hypoxia can increase the levels of FBG and FINS in rats, which may induce down-regulation of autophagy by inhibiting the Sesn2/AMPK/mTOR signaling pathway in the liver, thereby mediating abnormal glucose metabolism.